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## LIFE AMID DESERT CONDITIONS.

BY

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The influence of desert conditions upon the habits and customs of peoples, and on the spirit and life of nations, has been strong and abiding throughout all time. The life is nomadic, the government patriarchal, the dependence on the flocks and herds absolute, as a pastoral life is the natural life amid such climatic conditions. Aridity or semi-aridity favours a pastoral, nomadic life all over the world, except in the regions about the poles. On the other hand, moisture favours agriculture and a more settled form of government, far different habits of life, and naturally, therefore, far different thoughts and inspirations. People cannot transplant themselves from aridity to humidity, or from humidity to aridity, without great hardships and difficulty in adapting themselves to the new conditions.

The great problem of the arid western United States, that of water rights, has been complicated by the fact that the region has been settled from the humid East, which introduced the common law understanding of water rights that was brought to America from moist England.\*

The explorers and pioneers had no appreciation of the problems now vexing those who followed in their footsteps. They came from a race and communities that knew no need of moisture beyond that which fell from the clouds, and had no knowledge of irrigation except such as they might have absorbed from references to this ancient art in their Bibles. The first generation of homemakers among the plateaus and deserts were not much wiser than the explorers, the trappers, and the missionaries who had preceded them. Farms were few and far between, and the water required for their irrigation was cheaply diverted from the stream and applied to the soil with a prodigality which took no account of the future. Under these circumstances it is not strange that as the wilderness was carved into territories, and as the territories blossomed into states, these new communities applied the English common law to conditions it was never intended to fit. Had the Napoleonic or Spanish Code been chosen there would be a far different story to tell, for these were framed with an intelligent appreciation of the value of water for irrigation; but the western pioneers carried to their new homes English traditions as well as English speech, and planted English law and custom at the foundation of their institutions. This beginning was fraught with peril and frequently with far-reaching evil.

In viewing such a problem as the one before us, it is well to remember that no hard-and-fast lines can be drawn between deserts

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\* Wm. E. Smythe, *The Struggle for Water in the West* (*Atlantic Monthly*, Vol. LXXXVI, November, 1900, pp. 646-654).

and non-deserts. Bordering a desert where the rainfall is less than ten inches a year there is naturally a region where the actual amount may vary within a considerable range. Any region where the rainfall is, on the average, between ten and twenty inches a year is a grass or steppe region, or, as we might say, a semi-arid region. In the rainy season the vegetation vies in its luxuriance and beauty with that of the more humid areas; but in the dry season all is changed, and the area may present a truly desert-like appearance. In steppe lands as well as desert lands the great article of value is water, and every act of life is directly or indirectly dependent on the presence of water.

The general conception of a desert, held consciously or unconsciously by most people, is that it is a great tract of seemingly boundless plain, over which the blinding sand is constantly blowing with a severity that makes heroes of those who brave its attacks. The only variations in the monotonous uniformity of the landscape are supposed to be the gentle swells of the omnipresent dunes of sand, continually growing and marching in the direction of the prevailing wind. The climate is supposed to be extremely hot and enervating, and so severe that few forms of life can secure a permanent home. In fact, the oases are believed to be the only pleasant spots in an almost impossible land, beautiful in their colour effects, in striking contrast to their surroundings, which are supposed to be white. We think of oases as actually and relatively among the most beautiful spots in the world, veritable Gardens of Eden, with all that the name implies. It is held that a desert is a region to be avoided, to be crossed only under the direst necessity, and then as expeditiously as possible.

There are such regions, but they are few, and most deserts differ from the common conception. Sand is conspicuous by its comparative absence in a desert, and when found it is but rarely white and dazzling. One of the best short-hand descriptions of a desert is that of the desert-lover Charles F. Lummis, who says it consists of "sun, silence, and adobe." The adobe, which is fine soil of great potential richness, covering deeply nearly all the lowland and gentle slopes, is far more common than sand.

The desert may be divided into three kinds of surface—the stony surface, from which the loosened waste has been removed; the sandy areas, made of the coarsest waste; and the adobe lands, made of the finer rock particles. Even in the Sahara, our greatest desert, the sand areas are estimated as not to exceed a third of the surface.

The topography of a desert is very truly one of gentle slopes, but nearly all deserts contain striking contrasts of relief. In the Sahara, which has a mean altitude of 1,407-2,100 feet, there are mountain ranges over 7,000 feet in height; and in New Mexico and Arizona there are similar ranges or peaks rising 3,000-5,000 feet above the general level of the desert. Thus the relief of a desert is varied, and the landscape is anything but monotonous. In fact, there is a striking variety of forms in a given space.

Similarly, the climate of a desert is misunderstood. It is a region of great warmth in the middle of the day; but it is also extremely cold at night—a fact of great importance, for it means that one's blood is not continually overheated in a long, unbroken warm spell, such as are known on lee coasts in the regions of the prevailing westerly winds. The daily range of temperature may be as great, if not greater, than the annual range in some so-called more favourable regions. In Arizona and New Mexico a diurnal range of 60° F. is not uncommon; and in the Sahara a range of 130° in a single day has been noted. In the clear atmosphere of a desert region, therefore, the sun's rays are very penetrating, and thick sun-proof clothes are necessary. Those who wear thin clothes are severely sunburnt. The power of the sun in a dry climate is clearly described by Pumelly.\*

I doubt whether any one who has not wintered on the plains in the interior of a northern continent can appreciate the feelings which led the early inhabitants of Central Asia to love and worship the sun. In the intense cold of an elevated region, the plains of which, unprotected by forests, are open to the almost perpetual blast of the polar wind, life would be unbearable without the quickening influence of an unclouded sun. The atmosphere of Central Asia is intensely dry; thus, especially in winter, the sun rises, runs through its daily course, and sets, an unobstructed orb, whose rays, suffering a diminution of refraction, arrive at the surface with a greater degree of warmth than would obtain in more moist regions in the same latitude. How often have I felt then that, had I been born a nomad, I should have fallen down to worship the great light-giving god of day as he was adored by the earliest bards of our race, the authors of the Vedas.

The same respect for the power of the sun is shown by the habit of cattlemen and teamers in Arizona and New Mexico, who rise before the sun reaches them. They truly say that to sleep beyond the time when the sun reaches you is to have your "eyes burned."

The animal and plant life of a desert is varied and numerous, but different from that known in a moist climate. The floral life is comparatively abundant, except in the most extreme instances of dryness, and, in many places of our southwest, the well-known sage

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\* *Across America and Asia*, p. 376 *et seq.*

brush, or the grease wood, practically covers the ground. Besides the shrubs there are many flowering plants; and in New Mexico there is an abundance of grass land. Even where there would seem to be no possibility of grass one can often see, in forty-eight hours after a short-lived rain, the faint green fuzz of reviving vegetation. As regards animals, the Jack rabbit, the coyote, the prairie dog, the cottontail, and the rattlesnake, to say nothing of owls, ravens, and buzzards, are numerous in our own southwest. A prairie dog village is a sign to the traveller that he is getting "out West," and a Jack rabbit proves it. With the lowlier there are the higher forms of life. The desert and the steppes abound with sheep, goats, horses, and cattle, which are not, however, indigenous in our own country; and these form the chief dependence of a large and increasing population. The Sahara, with its 3,500,000 square miles, has an estimated population of 1,400,000, and an annual export trade of several million dollars.

Such are the contrasts between the actual and the supposed conditions in an arid area. A tourist, looking out across the expanse of the "manless land" from the comfort of a Pullman car, is impressed with its awful desolation and supposed ugliness. A person with a certain love for barbaric life, and who has the delightful ability of getting in touch with his human and physical environment, has a different feeling in his contact with the desert. To him the environment is most sublime and awe-inspiring, and he marvels not at the poetry and the philosophy and the noble thoughts that have arisen amid similar conditions in the Holy Land.

To one who approaches the desert for the first time, and in a sympathetic mood, the impression is one of vastness and freedom. The inviting curves of the plains suggest an unlimited expanse beyond, and the curious perspectives give ideas of vastly-extended distance and size. The mind is at ease, in the calm and serenity of the unbounded space. With the oncoming of night, with its clear, cool, bracing air, like that of a New England October day, and later with its brilliant stars or moonshine, the feeling of wonder and reverence is deepened. No matter how long one remains in the desert the beauty of the nights never ceases to be a marvel. To see the stars shining clearly and steadily every night, as they do occasionally on a very cold winter's night in moist regions, is a revelation that never ceases to be impressive.

The sunshine, like the nights, is impressive; but the excessive strength of the sun's rays frequently makes it hard for the novice to be impressed by other things about him, at least in the heat of

the day. If one can, however, get into the shadow, he marvels at the contrast, and glories in the comfort. Shadows in a dry region are strikingly in contrast with the sunshine in temperature. One cannot feel the heat creeping in and evidently seeking a victim, as under a New England apple tree, for shadows are cool and invigorating. They give the same comfort as the night, and one who has travelled, even a little, in the desert, comes to appreciate the value of the "shadow of a great rock in a weary land."

The silence of the desert, one of the three essentials of a true desert, according to Lummis, is wonderful in its impressiveness. George Adam Smith has well said, "No one can know how many voices a tree has until he comes up to it out of the silence of a desert." Curiously enough, however, the silence is not depressing. On the contrary, it is comforting, and it breeds no feeling of loneliness. To lie at night on the plains, under the clear, beautiful sky, with the knowledge that you are absolutely alone, even when the silence is broken by the howl of a coyote, does not give any sense of loneliness. One can easily be less alone amid such surroundings than in the throng and rush of a city, with its harsh noises, where one expects some sympathetic touch with his fellows.

The impressive beauty of the colours, also, of a desert landscape cannot be adequately described. The absence of dark green is soon not noticed, for the greys, reds, browns, and yellows are so quiet, so soothing, so varying in their intensity, and so thoroughly mingled that their quality cannot but be constantly in mind. To see the grand colours of a deep brown cliff brought out in a clear moonlight is to see one of the most wonderful effects. In the desert tints, as in the green of the humid country, the value of shadows in bringing out the quality and the contrast is not to be overlooked. In fact, after we become accustomed to the desert range of colours, the green of an oasis comes with a shock, like a misplaced touch in a beautiful picture.

Our reverence for oases is largely due to the bodily comfort they suggest. To pass from absolute want to an abundance of water is a delight, and to have added to the water all the food that a rich garden in a warm climate can produce is more than a delight, at least by contrast with the desert. But the pleasure has its limit, and we pass gladly on to the desert again.

One more contrast between humidity and aridity that makes a deep impression upon the visitor to the desert is the absence of odour, good or bad. Going into the desert one does not notice at first the loss of odours to which he has been accustomed in the humid

regions, but when we return to a damp climate after several weeks or months in an arid region the omnipresence of unpleasant odours is almost nauseating. It is then, perhaps for the first time, that we really appreciate the beautiful purity of the atmospheric conditions of the desert.

Such are some of the effects of the desert on the thoughts and feelings of a stranger. If he comes to stay amid desert conditions he will soon find that he is living the same life as the old inhabitants, and that the desert produces certain very permanent effects upon life conditions.

We have already seen how desert conditions tend to promote nomadic life. Nomadic life being dependent on the value of the flocks, the whole existence of the nomads is a direct result of the environment. Herbertson \* has summarized this as follows:

To tend thousands of head of cattle, and to water and milk the flocks, many persons are needed. The larger the household, the more numerous the sons and daughters and servants, the more can the flocks and herds of a family be increased. So from Biblical times onward we find that the head of a family, when sufficiently rich, is the husband of more than one wife, the father of many children, the master of many servants, many of them connected with him by blood. For the same reason the grown-up sons, when married, still remain by the father, and thus a large group grows up, all related by blood. In such a society great pride of descent is felt, and long pedigrees are carefully remembered. The head of the family is absolute; his word is law.

The individual traits of the nomads are also in certain ways the direct result of the environment. From the earliest history of this country great stress has been laid upon the keenness of vision of the Indians living on the great plains. As a matter of fact, the savage of the plains has no better sight than his civilized brother, as has been clearly proved by the studies of Hudson.† He has simply learned by long training and, perhaps, hard experience the ability to interpret truly the objects in his vision. Amid strange conditions he is more helpless than his book-trained, civilized brother. In those things that mean protection and safety the savage is, however, very keen and trained. A dust to an Indian is not merely a dust, for there may be an enemy beneath it. The Indian, therefore, has learned to tell the dust raised in a dust-storm from that raised by horses or sheep. If the dust is formed by equestrians, the Indians know it from a far distance, and, further, can tell whether the rider is an Indian or a white man, and whether he is alone or in a party. His sight, however, is just as

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\* *Man and His Work*, p. 25.

† *Idle Days in Patagonia*, pp. 164-184.

possibly defective from weakness or age as that of a white man, and just as easily remedied.

Nomadic life amid such surroundings has a deep effect on the imagination even of primitive peoples who come to give reference to those immediate or remote causes around that produce comfort or discomfort. The Indian who pays homage or reverence to the wild beasts is trying to appease the wrath of the cause of much evil with which he is very well acquainted through long experience.

George Adam Smith, in his remarkable study of the Holy Land and the effects of the environment on the thought of the people, considers that the scenery and climate of the Holy Land were largely accountable for the rise of the Christian religion, and he shows how the spirit of the landscape is breathed through the poetic language of the Scriptures.

\* The little details . . . . are, of course, not so frequent with the prophets as the long lines of the land, and its greater natural phenomena.

*He that sitteth on the circle of the earth,  
And the inhabitants thereof are as grasshoppers;  
That stretcheth the heavens as a curtain,  
And spreadeth them out as a tent to dwell in.*

(Isaiah xl., 22.)

Men who looked at life under that lofty imagination did not notice closely the details of their country's scenery. What infected them was the sense of space and distance, the stupendous contrasts of desert and fertility, the hard, straight coast with the sea breaking into foam, the swift sunrise, the thunderstorms sweeping the length of the land, and the earthquakes. For these were symbols of the great prophetic themes, the abiding justice and mercy of God, the steadfastness of His providence, the nearness of His judgments to life, which lies between His judgments as the land between the Desert and the *Great Deep*; His power to bring up life upon His people as spring rushes up on the wilderness; His awful last judgment, like *morning scattered on the mountains*, when the dawn is crushed upon the land between the hills and the heavy clouds, and the lurid light is spilt like the wine-press of the wrath of God. And if those great outlines are touched here and there with flowers, or a mist, or a bird's nest, or a passing thistledown, or a bit of meadow, or a quiet pool, or an olive-tree in the sunshine, it is to illustrate human beauty, which comes upon the earth as fair as her wild-flowers, and as quickly passeth away, which is like a vapour which appeareth for a moment on the hillside and then vanisheth; or it is to symbolize God's provision of peace to His people in corners and nooks of this fiercely-swept life of ours :

*He maketh me to lie down in green pastures;  
He leadeth me beside the still waters.*

(Psalm xxiii., 2.)

*They looked unto him, and were lightened;*

(Psalm xxxiv., 5, Massoretic text.)

where the effect is of liquid light, when the sun breaks through the clouds, rippling across a wood or a troubled piece of water.

\* George Adam Smith, *Historical Geography of the Holy Land*, p. 97.

*But I am like a green olive-tree in the house of God.*  
(Psalm lii., 8.)

*I will be as the dew unto Israel :  
He shall blossom as the lily, and strike forth his roots like Lebanon :  
His branches shall spread,  
His beauty shall be as the olive-tree, and his smell as Lebanon.*

(Hosea, xiv., 5, 6.)

Bring up man and the animals on the scene, and you see those landscapes described by Old Testament writers exactly as you will see them to-day—the valleys covered with corn, the pastures above clothed with flocks, shepherds and husbandmen calling to each other through the morning air, the narrow high-banked hillroads brimming with sheep, the long and stately camel trains, the herds of wild cattle—*bulls of Bashan have compassed me about*. You see the villages by day, with the children coming forth to meet the traveller (2 Kings vi.; Mark x., 13); the villages by night, without a light, when you stumble on them in the darkness, and all the dogs begin barking,—*at evening they return and make a noise like a dog, and go round about the city*. You see night,

*Wherein all the beasts of the forest do creep forth,  
The sun ariseth, they shrink together,  
And lay them down in their dens.  
Man goeth forth unto his work,  
And to his labour till the evening.*

You see those details which are so characteristic of every Eastern landscape, the chaff and rolling thorns blown before the wind, the dirt cast out on the streets; the broken vessel by the well; the forsaken house; the dusty grave.

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By numerous little tokens, we feel that this is scenery described by Highlanders: by men who, for the most part, looked down upon their prospects and painted their scenes from above. Their usual word for valley is *depth*—something below them; for terror and destruction some of their commonest names mean originally *abyss*. God's unfathomable judgments are *depths*, for the narrow platform of their life fell eastward to an invisible depth; their figure for salvation and freedom is a *wide* or a *large place*. Their stage slopes away from them, every apparition on it is described as *coming up*. And there is that singular sense, which I do not think appears in any other literature, but which pervades the Old Testament, of seeing mountain-tops from above. *Israel treadeth upon his high places*, as if mountain-tops were a common road; and *Jehovah marcheth upon His high places*, as if it were a usual thing to see clouds below, and yet on the tops of hills. Joel looks from his high station eastward over the tops of the mountains that sink to the Dead Sea, and speaks of *morn above the mountains broken and scattered upon them* by the heavy thunder-clouds.

The influence of aridity upon the daily habits and occupations of people is seen in many small and large ways; and it is a surprise to find how quickly the newcomer gets accustomed to the conditions and takes them for granted. To find soda crackers kept in open boxes, and yet to have them always crisp; to have salt dry without any cornstarch as an absorbent is a universal comfort, in the summer months. The manner of preserving meat by sun-drying

or "jerking" is also a natural outgrowth of aridity, just as pickling or smoking is a natural method of preservation of meats in a humid country. Broadly considered, deserts determine a certain uniformity of action and life in many varied ways, as may, perhaps, best be seen in the manner of travel, in the form of homes adopted, and in the raiment that has been found the best suited to comfort.

All travelling is by animal, we have already seen; but it is far different from the travel of a humid region. Roads are few, and the single horseman or the group of riders usually follow trails, and always the trails lead by water-holes or pockets, so that a map of Arizona, for instance, will show you the leading trails and watering-places. It should be remembered, however, that not every watering-place is an oasis. Trailing requires an observing mind, keen to interpret small things; but yet one follows a faint trail for long distances with much more comfort and surety than one follows a more complicated series of routes in the eastern United States.

The success of trail-following seems to depend on the climate as well as on the topography of the region. An Indian or a trained white will take a sight on a gap fifty or sixty miles away and, perhaps, make his own trail for it with perfect confidence. The clearness of the air makes the details clear; the absence of fogs assures a constant vision of the object desired, unless temporarily obscured by intervening hills. The attitude of the rocks seems to be an important causal factor in trailing. In a region of folded rocks, or of horizontal rocks, deeply and maturely dissected, the topography is varied and written largely in sloping profiles. Hence, a change in perspective may make an apparent change in form, so that any chosen peak or gap would not necessarily appear the same from slightly-altered points of view. Where, however, as in many deserts, the topography presents largely horizontal profiles, any particular peak or gap is more likely to appear the same, however viewed, and, hence, can be followed with more safety and precision.

As the people of a desert must be nomadic, rather than sedentary, their homes must be easily moved or easily duplicated. The essentials of a house are that it shall keep out the wind and the sand, the clothes being relied upon to keep out the cold. Hence, the summer brush shelters of the Navahoes, or the tepees, or wicki-ups of the Utes and other tribes, are admirably adapted for desert life. A brush shelter, that can be covered by a blanket on the sunny or windward side, offers ample summer protection, and may be kept in such orderly neatness that, humble as it is, it may vie with an old New England kitchen in appearance.

The winter timber, or stone and adobe *hogan* of the Navaho, is also a form of house easily built and very comfortable. Such a house, also, is admirably in colour sympathy with its surroundings. With its open door, always turned toward the rising sun, one may pass very near to a hogan without noticing it unless one sees the door. There is the same colour protection here as exists in the coyote, for instance, which, when quiet, is almost invisible at a distance of 200 yards.

The adobe of the desert, further, makes a very permanent sun and moisture proof building material, whether used as a cement or in brick form. The old stone houses of the cliff dwellers and ancient pueblos still retain the adobe cement after a lapse of years that no one knows. The ancient house of Santa Fé, called the oldest house in the United States, is also of adobe. The adobes are easily made and easily repaired, and they weather slowly.

In the form of adobe home, seen in New Mexico, or in Syria, we have another illustration of desert conditions. Flat roofs are the striking feature of nearly all the houses in an arid region, for they are more comfortable than sloping roofs in many ways. A steep-sloped roof is not necessary where there is little rainfall, and a flat roof does not permit a peak full of dead, hot air, such as is found in an Eastern attic or shed roof; an important matter in the heat of the day, when one naturally wants a house to be cool. Furthermore, a flat roof is of great value and popularity as a sleeping-place in all countries where a dewless night invites out-of-door sleeping. Thus, wherever possible, a flat roof has many advantages over a sloping roof.

Again, in the form of raiment adopted, the essential requisite is that it be sun and wind proof. Hence, dark clothes should be avoided, as usually they are by the Arabs, for instance. The clothes should be loose, so as to allow more non-conducting layers of air between, and so that they can be readily drawn about the head. The blanket of the plains Indian is, therefore, a very natural result of the climatic environment, and is very much more serviceable than a civilized overcoat. The blanket has the additional advantage that it is easily rolled and carried on the saddle in the heat of the day, and is at hand at nightfall or in a sudden storm. Thus a blanket, except as it is associated with squalor, is the appropriate dress for an Indian, and is a sign that invention has brought forth a form of body covering very well adapted to the environment.

Such are some of the habits and customs of desert dwellers.

When once the desert habit has been acquired it becomes a strong

habit, and one not easily removed. There is a strange and, perhaps, not wholly explainable fascination about desert life. The desire to get back to its purity and beauty is at times almost overwhelming, and it increases with each successive sojourn. There one finds many comforts and delights that cannot be found even amid the high altitudes of the moist areas of the world. The desert may tend to foster a rough form of life; but it breeds men whom one comes to honour for their manliness, their sincerity, their truth, and their vigour—men who are misrepresented in print, as a rule, and whom one must know to understand.

The same noble traits are found among some Indians as among the whites. Rough as they may be in some ways, they have an admirable manliness that is very lovable; and a sojourn among Indians shows you that the belief that the only good Indian is a dead Indian is all wrong, and the result of the action of the white man and not of the Indian. The arid West has much of value to teach the moist eastern United States, as any one who gets in touch with it soon comes to feel, perhaps with a certain degree of shame.